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<b>(21) International Application Number:</b> PCT/SE99/00950 <b>(22) International Filing Date:</b> 1 June 1999 (01.06.99) <b>(30) Priority Data:</b> 9801946-6                      2 June 1998 (02.06.98)                      SE <b>(71) Applicant (for all designated States except US):</b> ACT - ADVANCED CLEANING TECHNICS AB [SE/SE]; P.O. Box 10, S-515 21 Viskafors (SE). <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> NORDIN, Rudolf [SE/SE]; Hyggesgatan 7, S-502 57 Borås (SE). <b>(74) Agents:</b> ANDERSSON, Per et al.; Albihns Patentbyrå Göteborg AB, P.O. Box 142, S-401 22 Göteborg (SE).	<b>(81) Designated States:</b> AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the</i> <i>claims and to be republished in the event of the receipt of</i> <i>amendments.</i> <i>In English translation (filed in Swedish).</i>	
<b>(54) Title:</b> CLOTH FOR A DRY MOP  <b>(57) Abstract</b>  The invention being presented concerns a dry-mop fabric for attachment to a mop handle. It is designed to clean dry, soiled surfaces. It is distinguished by consisting of micro- or ultramicro-fibre or filament with a count of 0.60-0.25 dtex per fibre or filament and by being woven or knitted with loops on one or both sides of the fabric, with a loop height of 3-9 mm.		

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CLOTH FOR A DRY MOP.

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TECHNICAL FIELD:

The present invention concerns a mop fabric that is designed for attachment to a mop handle and to be used to clean dry, soiled surfaces, in contrast to regular  
15 mop fabric, which is designed for immersion in a water-based washing medium and is used wet.

BACKGROUND:

Textiles have always been used for cleaning and removing  
20 dirt from soiled surfaces. These textiles have been available in various qualities, but mostly in the form of weaves. In recent times, they have consisted of fibres of natural origin such as cotton, artificial fibres such as polyamide and/or polyester, or most  
25 commonly blends of such fibres. These textiles are most often woven or knitted. It is usual for cleaning fabrics to have different-sized loops, made from various materials, which protrude from the ground fabric. An example of the type of fabric that is designed to be  
30 attached to a mop handle and used wet is described in Swedish patent no. 94 03398-2.

THE TECHNICAL PROBLEM:

As a rule, satisfactory results are obtained with regard  
35 to the actual cleanliness of a floor when a wet mop is used to clean it. However, a film of moisture remains on the floor for some time and if anyone walks on the floor

5 soon after it has been cleaned, it will quickly become  
soiled again. At the same time, the moisture adheres to  
the soles of the shoes and could soil other, clean  
surfaces if they are trodden on. In addition, there is  
always the inconvenience of having to use a bucket or  
10 similar container in which to carry the washing liquid  
when the wet-cleaning method is used. The washing liquid  
also consists of a mixture of water and chemical  
detergent, which are costly and can sometimes cause  
allergic reactions as well as an unpleasant odour. Water  
15 "wears out" the floor material, triggers emissions from  
the material, seeps into cracks and uneven surfaces and  
causes the growth of bacteria and mildew.

Dirt emulsifies in water that is used for cleaning. If  
20 any of this water is left on the floor, the dirt  
particles will remain behind once the water has  
evaporated. Quite simply, the floor will not be clean.

#### THE SOLUTION:

25 There has therefore always been a strong desire to be  
able to clean a floor or similar surface by using as dry  
a cleaning method as possible. As per the invention  
being presented, a dry-mop fabric has now been produced  
for attachment to a mop handle and to be used to clean  
30 dry, soiled surfaces. This dry-mop fabric is  
distinguished by it consisting of micro- or ultramicro-  
fibre or filament with a count of 0.60-0.25 DTEX per  
fibre or filament and by it being woven or knitted with  
loops on one or both sides of the fabric, with a loop  
35 height of approximately 3-9 mm.

5 As per the invention, the loops are made of polyamide or polyester fibre in various proportions, or a blend of these fibres in one and the same loop.

As per the invention, the cross-section of the filament should not be round, but preferably have as rectangular  
10 a shape as possible, with flat sides.

#### DETAILED DESCRIPTION OF THE INVENTION:

The dry-mop fabric, as per the invention being presented, is designed for attachment to any mop handle  
15 and to be used to clean soiled surfaces. The mop handle is not included in the invention; any mop handle can be used. It is of course also possible to use this dry-mop fabric without a handle by simply using the fabric on its own to clean dry, soiled surfaces by hand. If there  
20 is any water on the surface, it is naturally also possible to use the fabric, as per the invention, to the same good effect - especially since the fabric is extremely absorbent.

25 The fabric consists of a ground fabric with protruding loops on one or both sides. The fabric can be woven or preferably knitted, so that the loops are firm and cannot be pulled out. The material comprising the loops should consist of micro- or ultramicro-fibre or filament  
30 with a count of 0.60-0.25 DTEX per fibre or filament. Dtex is a unit of measurement, where 1 DTEX represents one fibre with a length of 1 000 metres and a weight of 1 gram.

35 As per the invention, the material in the fibres is synthetic and the loops may consist of two different materials, i.e. a number of the fibres could be

5 polyamide, while the remainder could be polyester, for instance. As per the invention, it is also possible that the individual loops could consist of a blend of polyamide and polyester as well as contain natural fibres.

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As per the invention, the cross-section of the filaments should not be round, but have flat sides, preferably slanting and with as rectangular a shape as possible, whereby the fibre surface will be as large as possible.

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As per the invention, the loops should be at least 3 mm and no more than 9 mm in height. The most advantageous measurement is in the region of 6-8 mm. Each loop must consist of a large number of fibres. The closeness of the loops, i.e. the number of loops per unit of area, the yarn thickness and the loop height must be proportioned so that when the fabric is pressed against a surface underneath it the loops remain upright or lie at an angle of no more than 45° to an imaginary vertical line. The force indicated in this instance is the normal weight of the mop handle plus some strength exerted by the operator, who holds the mop and moves it forwards. This maximum angle means that the part which is in contact with the surface underneath largely consists of transverse fibres. Because of the position, flatness and closeness of the fibres across the entire surface of the mop, a propulsive effect on the dirt particles or other impurities arises. The particles are attracted to and accumulate on the fibre surfaces, as well as between the fibres and inside the loops. The relatively high loop height combined with the collectively large fibre

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5 surface contributes to its ability to accumulate a large quantity of grime or dirt particles.

The cleaning action is highly effective because of the microfibres' extreme softness, the length and closeness  
10 of the loops and the count and surface dimensions of the fibres. Even though the fibres are soft and the loops are long, the loops will still not be flattened because they support each other owing to their closeness. Since every surface is more or less uneven and the fibres in  
15 the mop fabric adapt to the unevenness of the surface underneath and force their way into even extremely small hollows, the fabric can also remove and accumulate the very small particles that are deposited in these uneven areas.

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By combining the various parameters as per the invention being presented, an extremely high-quality dry-mop fabric with extensive cleaning ability has been produced.

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Because of its great ability to absorb liquids and particles it should, in principle, also be possible to use the mop for drying up liquid, with simultaneous absorption of both the water and any emulsified dirt  
30 contained in it.

The invention is not limited to the design described, but can be varied in different ways within the scope of the patent claims.

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## 10 PATENT CLAIMS:

1. Dry-mop fabric for attachment to a mop handle and designed to clean dry, soiled surfaces, characterized in it consisting of micro- or ultramicro-  
15 fibre or filament with a count of 0.60-0.25 DTEX per fibre or filament and by it being woven or knitted with loops on one or both sides of the fabric, with a loop height of 3-9 mm.
- 20 2. Dry-mop fabric according to patent claim 1, characterized in the loops being made of polyamide or polyester fibre or a blend of these fibres in one and the same loop.
- 25 3. Dry-mop fabric as per patent claim 1 or 2, characterized in the cross-section of the filament not being round, but preferably having a rectangular shape with flat sides.



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 99/00950

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
IPC6: A47L 13/16, A47L 13/20 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols)		
IPC6: A47L		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
SE,DK,FI,NO classes as above		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
WPI		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9610946 A1 (ACTUELLE TRICOT I BORAS AB), 18 April 1996 (18.04.96), page 5, line 25 - line 34; page 6, line 12 - line 29; page 7, line 15 - line 17 --	1-3
X	DE 29706500 U1 (DICKEL, KLAUS ET AL), 31 July 1997 (31.07.97), claims 3,6 --	1-3
A	SE 431158 B (BELE RESEARCH AB), 23 January 1984 (23.01.84), claim 7 -- -----	1
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**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

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